

way, showing how the record of more-or-less private writing underpins *Selborne*, and "demonstrates White's systematic, if sometimes halting, development". More than this, Foster singles out those aspects of the work that set it apart from the usual compendium of curiosities, and give it a contemporary resonance.

One such aspect is White's use of deliberate experiments in pursuit of an understanding of what was going on around him. These vary from simple observations as to the efficacy of removing mouldiness from some melon plants by "the experiment of clipping off the infected parts with a pair of scissors", or experimenting with peat dust instead of old thatch in the bottom of potato trenches, through to sowing "a pot with cucumber-seeds, and set[ting] it by the parlour-fire for experiment-sake", to rather complex and detailed experiments carried out in connection with ventilating a hotbed. The great age of experiments in farming by the Russells and others (of which the Rothamsted Field Station is one legacy today) still lay about half a century ahead in White's time, and it would be interesting to see a larger analysis that explored the extent to which White's style and ideas, and this larger enterprise, were part of the same broad current.

Foster also presents an assessment of the accuracy of the observations recorded in White's writing, and in his *Journal* in particular. As Foster remarks, "to gain purchase on the level of accuracy deployed in the records of a natural historian two centuries ago is not easy. The best way would be to walk the lanes and paths of Selborne with White and to verify his

observations as he made them, but that is clearly impossible". Foster gives a careful analysis of the likelihood that White actually saw what he says he saw, and that the weather was as he recorded it, and decides if there are errors "they have crept into the record against White's practice, and against his conscious caution". To a degree unusual in the eighteenth century, White seems to have understood the procedures and problems of scientific record-keeping, noting that "the bane of our science is the comparing one animal to another by memory in order to describe it".

Although he spent most of his life in Selborne, White was not isolated. His correspondence includes exchanges with some of the most distinguished naturalists and travellers of his time (Lightfoot, Pennant and Banks among them). He maintained a lifelong involvement with the affairs of the Oxford college (Oriell) where he was an undergraduate and later Fellow, although — as described by Foster — the running of the college at that time seems to me to reflect little credit on anyone associated with it.

Foster's book is probably more for the *Selborne* aficionado than the general reader. It is, however, far more than the sadly common shoebox of file cards arranged by chronology or theme, and those with an interest in Gilbert White will find in it an engaging account of the intellectual odyssey of that remarkable man. □

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Radiating curiosity

Eric Denton

In Search of Nautilus. By Peter Douglas Ward. *Simon & Schuster: 1988. Pp. 238. \$19.95.*

THE pearly nautilus is one of the most beautiful and famous of all sea creatures, giving its name to the wondrous craft imagined by Jules Verne and to the submarine built early in the last century by Robert Fulton. It is evidently related to the fossil nautiloids and ammonoids and seems, much more than the coelocanth, to be the archetype of the 'fossil' animal. Peter Ward had two general aims in writing a book about this extraordinary animal. First, using nautilus research as an example, to show how fitful the scientific process can be. Secondly, to tell the story of nautilus itself. He has succeeded in both.

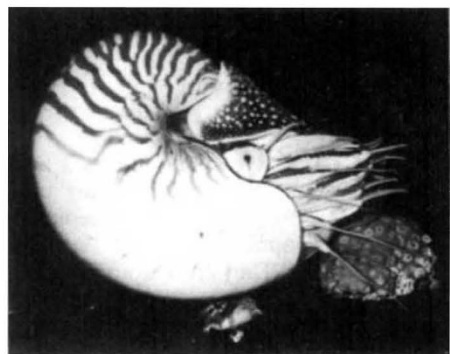
Ward begins by reviewing the earlier descriptions and speculations of Aristotle,

Robert Hooke, Richard Owen and others to bring his story to the end of the nineteenth century. The main business of zoologists was then widely believed to be that of understanding and following the processes of evolution, and great hopes were pinned on the study of the early development of animals during which they were thought to recapitulate their evolutionary history. The nautilus was felt to be a key animal. With this in mind, a very able Cambridge zoologist, Arthur Willey, spent the years 1894–1897 working on the nautilus in the south Pacific, always under difficult and sometimes dangerous conditions. He discovered a great deal but, although many of his animals laid eggs, he sadly failed to find any that were fertile.

The account of Willey's adventures and results is followed by an assessment of the researches of Anna Bidder, John Gilpin-Brown and myself in the early 1960s. My only 'complaint' about this account is that I am sure that I used either the expression, "damn all" or "sweet Fanny Adams" rather than that attributed to me on page

93. Ward then recounts the rapid advances made, mainly by American zoologists and geologists, during the past 20 years. He keeps a good balance between the development of scientific ideas, the ways in which the problems posed were solved, and the difficulties of research and dangers to researchers from boats, storms, sharks and bureaucrats. He is well acquainted with the scientists who have worked on the nautilus recently and has taken the trouble to meet those whom he did not know well.

The book concentrates on four sets of



Ancient design — the chambered nautilus.

problems. First, how does the nautilus achieve and use its buoyancy system? Secondly, where and how does it live? Thirdly, how many species are there and what is their place in evolutionary history? And, lastly, how does nautilus reproduce and what can we learn about evolution of cephalopods from its embryological 'history'? On all of these points Ward has a great deal of successful research to report, research that has given conclusive results which will not be overturned in future. He ends on two contrasting thoughts — that the latest work seems to show that, surprisingly, nautilus is a very young form in the midst of a great radiation of species and that, less surprisingly, its future is most threatened by man's predations.

A few years ago the New York Academy of Sciences decided to launch a project to help scientists and science writers to get books published for a popular audience. The aim was to communicate the excitement of discovery without drifting into superficiality. *In Search of Nautilus*, published as part of this project, is admirably successful in achieving the Academy's aims. It should attract a wide general readership, as well as the attention of professional geologists and zoologists who will find much of interest, lucidly and amusingly expressed by an acknowledged international authority. □

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